Dec. 30, 1941. H. W. START ET AL 2,268,314

STRAIGHT-BAR KNITTING MACHINE

Filed April 3, 1941

Fig. 1.

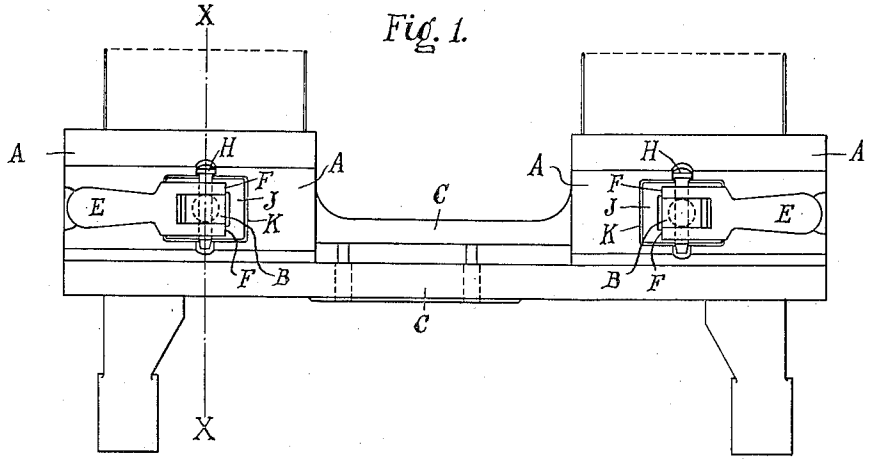


Fig. 2.

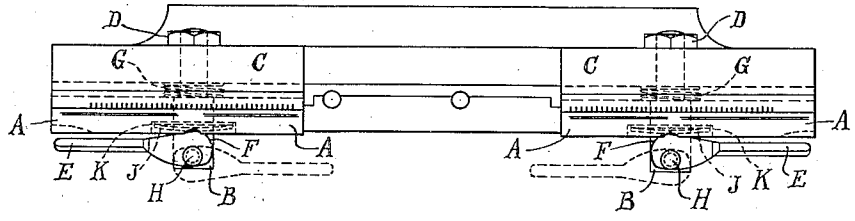


Fig. 4.

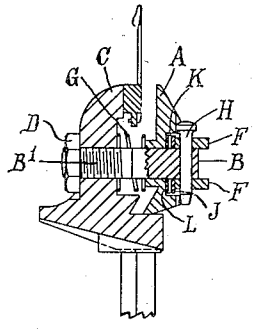


Fig. 3.

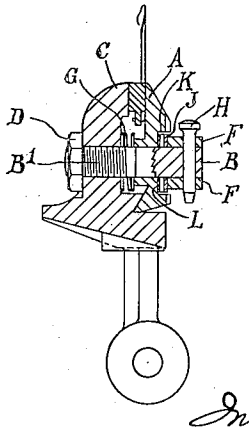
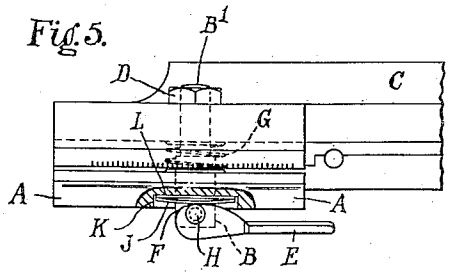


Fig. 5.



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STRAIGHT-BAR KNITTING MACHINE

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8 Claims. (Cl. 66—114)

This invention relates to improvements in straight-bar knitting machines and refers particularly to the method of securing the needles in position in the needle bars of such machines.

In straight-bar knitting machines the needles are disposed in tricks cut in the needle bar and are held in position by a cap which is secured to the needle bar by set screws. When therefore it is necessary to remove a needle which has become damaged or broken in order that it may be replaced by a new one the cap has to be withdrawn a sufficient distance from the needle bar in order to permit of the damaged or broken needle being removed and a new one inserted in its place.

The cap is usually divided into sections each of which is held in position by one or more set screws and in order to withdraw the appropriate section of the cap a sufficient distance, when it is necessary to replace a broken or damaged needle, the set screw or screws holding the section must be undone several turns and screwed up again when the new needle is in position. This operation has to be performed whilst the machine is standing and takes an appreciable amount of time when the screws are accessible and will take much longer when the knocking-over bits are disposed in the front of the needle bar so that the set screws are not readily accessible.

The object of the present invention is to provide means whereby the caps for holding the needles in position in the needle bar can be instantaneously released and locked.

According to this invention the cap or each section of the latter for holding the needles in position in the needle bar is held in its operative position by locking means which can be operated instantaneously to either secure the cap or each section thereof in its operative position or release it therefrom. Springs may be provided to automatically withdraw the cap or sections thereof a sufficient distance from their operative positions when the locking means is released to permit of a damaged or broken needle being removed and replaced by a new one.

The invention will now be more particularly described with reference to the accompanying drawing in which:

Fig. 1 is a front elevation and

Fig. 2 a plan of a needle bar for a machine adapted to knit the heel tabs to a stocking blank.

Fig. 3 is a sectional elevation on the line XX of Fig. 1.

Fig. 4 is a sectional elevation on the line XX and

Fig. 5 a plan of part of the needle bar showing the locking cap released for removal of a needle or needles.

Like letters indicate like parts throughout the drawing.

In carrying out this invention the cap is preferably divided into sections A and each section thereof is mounted on one or more studs B detachably secured in the needle bar C. The studs B are disposed on the front of the needle bar C and are held in position by screw nuts D disposed on the rear side of the needle bar and engaging the ends of the screw threaded shanks B^1 on the studs which engage in screw threaded holes in and extend through the needle bar C.

The outer ends of the studs B pass through the holes provided for the purpose in the sections A of the cap and extend some little distance to the front thereof. In order to hold and lock the sections A of the cap in operative position the following arrangement is adopted. Pivoted on the outer end of each stud is a lever E and this lever is provided with a cam surface F which in one arrangement engages with the outer face of the respective section A and moves the latter into and locks it in its operative position when the lever is angularly adjusted in one direction about its pivot. The cam surface F is preferably arranged so that the lever lies along the face of the section when the latter is in its operative position as shown in Figs. 1 and 2 and is turned through 180 degrees in the reverse direction, that is into the position shown in dotted lines in Fig. 2 to release the section.

A spring G is preferably disposed on each stud D between the opposing faces of the needle bar C and the sections A so that the sections are automatically moved away from the needle bar when the cams associated therewith are operated to release the sections as shown in Figs. 4 and 5 and the cams are so shaped that the amount of movement permitted to the sections is sufficient to permit of the removal and replacement of the needles.

In the preferred construction the pivoted end of each lever may be in the form of a fork as shown, the outer end of the associated stud B being disposed between the two arms forming the fork which is attached to the stud by a pivot pin H and these two arms are shaped to provide the necessary cam surface F to engage with the section and provide a direct thrust thereon. In order to provide for wear the cam

surfaces F preferably engage with a steel plate J having an opening therein to pass over the studs B and disposed in a recess K provided for the purpose in the front face of the sections A so that should any wear on the cam surface take place the correct adjustment of the mechanism can be obtained by the substitution of a slightly thicker plate in the recess.

If desired the steel plate J may be slightly curved in plan as shown in the drawing so as to form a leaf spring and an additional plate L provided in the recess K to prevent wear between the plate J and the section A. Any wear taking place can be corrected by the substitution of a thicker plate L.

The pivot pins H are made removable so that the levers E can be readily disconnected from the studs B in order that the plates J or L may be changed and to permit of the removal of the needle retaining cap or sections A when necessary.

The invention is shown applied to a needle-bar of a machine for knitting the heel tabs to a stocking blank as it is particularly suitable for this type of machine owing to the frequency with which the needles are damaged during the running of the blanks onto the needles.

In this type of needle bar one section of the needle retaining cap is sufficient to retain each group of needles in position but it will be understood that where a full set of needles is used the sections may be disposed end to end.

With the arrangement described the caps which retain the needles in position in the needle bar are instantaneously locked and released, the levers are easily accessible and easily operated so that when it is necessary to replace a damaged or broken needle this operation can be effected in the minimum amount of time.

What we claim as our invention is:

1. A needle-bar for a straight-bar knitting machine comprising a bar, tricks in the bar to receive the needles, needles, a cap to retain the needles in the tricks, a stud secured in the bar and passing through the cap and a lever pivoted to the end of said stud and having cam surfaces adapted to instantaneously lock or release the cap when the lever is angularly adjusted, substantially as described.

2. A needle-bar for a straight-bar knitting machine comprising a bar, tricks in the bar to receive the needles, needles, a plurality of caps to retain the needles in the tricks, studs in the bar and passing through the caps, a plurality of levers one pivoted to the end of each stud and cam surfaces on the levers adapted to lock or release a corresponding cap when the levers are angularly adjusted and said cam surfaces being so disposed that the levers lie close to the outer faces of the caps when in their locking position, substantially as described.

3. A needle-bar for a straight-bar knitting machine comprising a bar, tricks in the bar to receive the needles, needles, a plurality of caps to retain the needles in the tricks, studs secured in the bar and passing through the caps, a plurality of levers having fork shaped ends embracing corresponding studs and pivoted thereto and cam surfaces disposed on the arms forming the fork and adapted to instantaneously lock or release the corresponding cap when the corresponding lever is angularly adjusted, substantially as described.

4. A needle-bar for a straight-bar knitting machine comprising a bar, tricks in the bar to receive the needles, needles, a plurality of caps to retain the needles in the tricks, studs in the bar and passing through the caps, a plurality of levers one pivoted to the end of each stud and cam surfaces on the levers engaging steel plates disposed in recesses in the caps when the levers are angularly adjusted to lock the caps, substantially as described.

5. A needle-bar for a straight-bar knitting machine comprising a bar, tricks in the bar to receive the needles, needles, a plurality of caps to retain the needles in the tricks, studs secured in the bar and passing through the caps, a plurality of levers one pivoted to the end of each stud, cam surfaces on the levers engaging curved steel spring plates disposed in recesses in the caps and a plurality of backing plates one associated with each spring plate, substantially as described.

6. A needle-bar for a straight-bar knitting machine comprising a bar, tricks in the bar to receive the needles, needles, a cap to retain the needles in the tricks, locking means associated with the cap adapted to instantaneously lock or release the cap and at least one spring disposed between the opposing faces of the cap and bar to move the cap away from the bar when it is released, substantially as described.

7. A needle-bar for a straight-bar knitting machine comprising a bar, tricks in the bar to receive the needles, needles, a plurality of caps to retain the needles in the tricks, studs secured in the bar and passing through the caps, a plurality of levers one pivoted to the end of each stud adapted to lock or release the caps when angularly adjusted and coil springs on the studs between the caps and the bar to move the caps away from the bar when released, substantially as described.

8. A needle-bar for a straight-bar knitting machine comprising a bar, tricks in the bar to receive the needles, needles, a cap for retaining the needles in the tricks, and means including a stud extending through said cap and a lever pivoted to the end of said stud for instantaneously locking or releasing the cap, substantially as described.

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